

NOTES ON BIOLOGY OF *HYBOMITRA DAECKEI* (HINE) (DIPTERA: TABANIDAE)^{1,2}

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ABSTRACT: *Hybomitra daeckei* (Hine) was observed ovipositing on *Scirpus maritimus* L. and *Spartina alterniflora* Loisel. on a New Jersey salt marsh. Egg masses were also found on *Phragmites* and *Distichlis*. Larvae from these eggs were maintained as long as one year but did not pupate. Males hovered over the salt marsh in the morning and prior to hovering of *Tabanus nigrovittatus* Macquart.

Hybomitra daeckei (Hine) is a coastal species of horse fly which is found from Maine to Georgia (Thompson 1967). This is an early season species and has been observed during May and June in New Jersey. *H. daeckei* seldom bites humans but can be a significant pest on livestock (Pechuman 1972).

Hansens (1952) reported that adult *H. daeckei* emerge 7 to 10 days before *Tabanus nigrovittatus* Macquart, and may be useful in forecasting the emergence of *T. nigrovittatus*. The larval and pupal stages of *H. daeckei* were described by Tesky and Burger (1976) from a single specimen collected "on a small island in a large, shallow body of impounded slightly brackish water" at the Chinocoteague National Wildlife Refuge. Additional references to the immature stages of this species have not been found.

In June 1979, approximately 10 *H. daeckei* were observed ovipositing on *Scirpus maritimus* L. and *Spartina alterniflora* Loisel. in a salt marsh near Cedarville, NJ. Most of the females were in a head down posture while ovipositing. The ovipositing females were usually very tolerant of an observer approaching and handling the plant on which the fly was ovipositing. Ovipositing flies were easily captured, and in some cases, continued ovipositing on the plant after being placed in a container. We also found 23 other egg masses of this species, mostly on *Scirpus maritimus* but also on *Phragmites communis* Trin., *Spartina alterniflora*, and *Distichlis spicata* (L.). The *Scirpus* was in an area dominated by *Spartina patens* (Ait.).

The egg masses were usually one tiered with the eggs at an angle of about 60 degrees from horizontal. We found five egg masses in 1980, four

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on *Scirpus* and one on *Phragmites*. Those on *Scirpus* were 43-58 cm from the marsh surface (mean of 50 cm) and the egg mass on *Phragmites* was at a height of 73 cm. All egg masses were 4.5-13 cm from the end of the blade (mean of 7.3 cm). The number of eggs in three masses ranged from 240 to 500 with a mean of 418 eggs. The eggs were white when laid but turned brown after several hours.

The eggs hatched 5 to 7 days after being laid. During the incubation period, the eggs were kept in snap cap vials or petri dishes with wet filter paper. Petri dishes were unsatisfactory because many of the larvae crawled out soon after the eggs hatched. Of the 278 neonate larvae maintained in the laboratory, only 12 survived for a year before being adventerly destroyed. Larvae reached the 7th to 11th instars in 5 months. The larvae were then incubated at 4°C for two months to simulate overwintering. The temperature was returned to 27°C and one larva reached the 13th instar but none of the larvae pupated.

While it is possible that the larvae require 2 years to mature, they appeared to be fully grown after only 5 months in the laboratory. The requirements for pupation of *H. daeckei* are not known but must be different from those of *T. nigrovittatus* which pupates readily in the laboratory. Possibly for this early season species, increasing photoperiod triggers pupation.

We observed male *H. daeckei* hovering on 6 separate days from 28 May to 18 June (Table 1). Most of the observations were made on a *Spartina patens* marsh close to the ecotone, but one male was observed hovering in a stand of *Phragmites*. The duration of hovering was 5 to 65 minutes with an average of 37 minutes each day. Hovering began when the ambient temperature was as low as 17.8°C. Each day, the *H. daeckei* males began to hover about one hour before *T. nigrovittatus* males. Both species were observed hovering simultaneously only once, for a period of about 4 minutes. The males hovered at about the same height as the top of the marsh vegetation. During total calm the males faced in any direction while hovering, but in a breeze they faced into the wind. Copulation was observed once. The flies coupled in midair and then landed on a blade of grass, end to end. The pair was collected for oviposition.

Additional investigations are needed to define the larval habitat of *H. daeckei*. Larvae of this species have not been reported from salt marshes despite extensive larval surveys on the marshes in Massachusetts, Connecticut, Long Island, New Jersey, North Carolina and other areas along the eastern coast (Meany et al. 1976, Magnarelli and Anderson 1978, Freeman and Hansens 1972, Dukes et al. 1974). Emergence traps have been used on New Jersey salt marshes, but have been unsuccessful in collecting *H. daeckei* (Rockel and Hansens 1970). This species seems to have a restricted larval habitat. Our information on oviposition sites may assist future investigators in defining the larval habitat of *H. daeckei*.

Table 1. Time (EDT) of male *H. daeckei* hovering on a salt marsh near Cedarville, NJ.

Date	Hovering Observed	
	start	finish
28 May 80	0935	0940
4 June 80	0820	0925
5 June 80	0815	0900
11 June 80	0850	0905
13 June 80	0725	0825
18 June 81	0725	0745

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